

Remarks:

None of the previously-presented claims have been amended or cancelled. Therefore, claims 1-51 remain for consideration in this application. Claims 1, 6, 11, 16, 20, 27, 33, 34, and 39 are in independent form.

§ 103 Rejections Based on Individual References

In the Office Action of August 4, 2006, the Examiner rejects claims 1-51 under 35 U.S.C. 103(a) as being unpatentable over WO 97/17393 to Asano et al. (hereinafter, Asano), or U.S. Patent No. 3,057,909 to Sebelist et al. (hereinafter, Sebelist), or U.S. Patent No. 4,782,181 to James (hereinafter, James). In support of this rejection, the Examiner asserts that each reference discloses "a process for the production and/or the esterification of carboxylic acid beginning with a water-wet cake of a carboxylic acid prepared from the same components as claimed by applicants *except for specific vapor seal zone*" Office Action, p. 2, ll. 14-17 (emphasis added). Although admitting that none of the cited references disclose Applicants' claimed vapor seal zone, the Examiner goes on to allege that "the vapor seal zone could be envisaged by the skilled practitioner." Office Action, p. 3. l. 14. For at least the reasons detailed below, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness based on Asano, Sebelist, or James.

To establish a *prima facie* case of obviousness based on a single prior art reference, the reference must teach or suggest all of the claim limitations. M.P.E.P. § 2143. Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness because, for example, the prior art references relied on by the Examiner

fail to teach or suggest each and every limitation of the claims of the present application. For example, each independent claim in the present application (i.e., claims 1, 6, 11, 16, 20, 27, 33, 34, and 39) recites the step of “routing said water-wet carboxylic acid cake to a vapor seal zone.” In the Office Action, the Examiner concedes that the prior art does not teach or suggest this limitation. See Office Action, p. 2, ll. 16-17. Yet, the Examiner contends that this step would have been obvious to a person of ordinary skill in the art because “the vapor seal zone could be envisaged by a skilled practitioner.” Office Action, p. 3. l. 14. However, it is respectfully submitted that the Examiner has pointed to nothing, either in the prior art of record or in the knowledge of the art generally, to support this assertion. Moreover, the Examiner has provided no evidence of a motivation to modify these references to include the step of routing the water-wet carboxylic acid cake to a vapor seal zone. Thus, Applicants must conclude that the Examiner is either taking “official notice” of this assertion or relying on “common knowledge” in making this rejection.

If the Examiner is indeed taking official notice or relying on common knowledge, Applicants point the Examiner to M.P.E.P. § 2144.03, which states that “[i]n limited circumstances, it is appropriate for an examiner to take official notice of facts not in the record or to rely on ‘common knowledge’ in making a rejection, however such rejections should be judiciously applied. ... Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known.” If the Examiner is taking official notice to support the assertion that routing the water-wet carboxylic acid cake to a vapor seal zone would

be obvious, the Examiner must make this intention clear. However, Applicants respectfully submit that because, for example, the step of “routing the water-wet carboxylic acid cake to a vapor seal zone” is not even hinted at in the prior art of record, this step could not be considered to be a fact “capable of instant and unquestionable demonstration as being well-known.” Thus, taking official notice in this circumstance would be improper. Moreover, if the Examiner is relying on common knowledge as the principle evidence to support this assertion, this too is improper. Applicant’s note that “[i]t is never appropriate to rely solely on ‘common knowledge’ in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based.” *Id.* (citing *Zurko*, 258 F.3d 1379, 1385, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001)). Thus, Applicants maintain that the Examiner’s reliance solely on common knowledge or official notice in this circumstance cannot sustain a *prima facie* case of obviousness. Thus, such obviousness rejection should be withdrawn.

In addition to failing to disclose the “routing said water-wet carboxylic acid cake to a vapor seal zone” limitation of the independent claims, Applicants submit that the prior art references relied on by the Examiner also fail to teach or suggest the step of “adding at least one diol to said water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form said carboxylic acid/diol mixture,” which is recited in each of Applicants’ independent claims.

Turning first to the disclosure of the James reference. Contrary to the Examiner’s assertion, James does not teach or suggest that a diol be added to a water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form a carboxylic acid/diol mixture. Instead, James teaches that after hydrogenation, purified TPA

crystals are “recovered by crystallization, centrifugation, and drying.” Col. 1, II. 34-36. The purified TPA is then “useful for direct esterification with a diol.” Col. 3, II. 59-60. James, therefore, teaches away from adding a diol to a water-wet carboxylic acid cake. Thus, in addition to failing to teach the step of “routing said water-wet terephthalic acid cake to a vapor seal zone,” James fails to teach or suggest the step of “adding at least one diol to said water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form said carboxylic acid/diol mixture.”

The Sebelist reference also does not teach or suggest the addition of a diol to a water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form a carboxylic acid/diol mixture. Rather, Sebelist teaches that glycol is added to water to form the “initial glycol-water solution,” and then TPA is added to this solution. Col. 2, II. 30-35; Col. 3, II. 23-42. Although silent on whether the TPA is a dry solid when added to the aqueous glycol solution, there is also no teaching or suggestion to the contrary, and certainly no affirmative suggestion that the TPA be a water-wet carboxylic acid cake. Further, since Sebelist only mentions water in solution with the glycol, one is left to conclude that Sebelist envisioned a dry TPA solid as the starting material being added to the aqueous glycol. Thus, it cannot be said that Sebelist teaches or suggests “adding at least one diol to said water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form said carboxylic acid/diol mixture” as required by the claims of the present invention.

Applicants respectfully submit that the Examiner is misinterpreting the prior art, as both Sebelist and James follow the conventional method of either starting or ending with an isolated, dry TPA solid and do not teach or suggest a water-wet carboxylic acid

cake. The conventional approach for producing a terephthalic acid/diol mixture suitable as a starting material for polyester or co-polyester production is a multi-step process requiring the isolation of a purified, dry terephthalic acid (TPA) solid *before* adding a diol. In the Applicants' invention, a diol is added directly to a water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form said carboxylic acid/diol mixture. Neither James nor Sebelist teach this step of "adding at least one diol to said water-wet carboxylic acid cake," nor do they teach or suggest the step of "routing said water-wet terephthalic acid cake to a vapor seal zone." Accordingly, Applicants respectfully submit that because these references do not teach or suggest all of the claim limitations, they cannot support a *prima facie* case of obviousness, and Applicants request that such rejection be withdrawn.

With respect to the Asano reference (same as U.S. Patent No. 5,994,499), Applicants assert that this reference does not teach or suggest the above-mentioned claim limitations that were identified as being absent from James and Sebelist. In addition, Applicants respectfully submit that Asano is non-analogous art and requests that it be withdrawn as a prior art reference because it is totally unrelated to the field of the present invention or the problem solved by the present invention. Asano is directed towards a process of granulating polytetrafluoroethylene (PTFE) into a granular powder for molding. Specifically, Asano is aimed at providing a PTFE powder at high yield without using an organic liquid. See U.S. Patent No. 5,994,499, Col. 1, ll. 26-30. Contrary to the Examiner's assertion, Asano does not teach, suggest, or even relate to the esterification of a carboxylic acid beginning with a water-wet cake, or to

conventional methods of TPA production. Thus, Applicants respectfully request that this reference be withdrawn.

§ 103 Rejection Based on a Combination of Multiple References

In the Office Action, the Examiner further rejects claims 1-51 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 4,892,972 to Schroeder et al. (hereinafter, Schroeder) in view of U.S. Patent No. 5,476,919 to Schaeffer (hereinafter, Schaeffer). In the Office Action, the Examiner asserts that the prior art “inherently through the process steps would include a resulting water-wet cake” and thus renders the present invention obvious.

In order to establish a *prima facie* case of obviousness based on multiple prior art references, the combination of references must teach or suggest all claims limitations; there must be some suggestion or motivation, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to modify or combine reference teachings; and there must be a reasonable expectation of success. M.P.E.P. § 2143. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed Cir. 1991).

The Examiner has failed to establish a *prima facie* case of obviousness based on the combination of Schroeder and Schaefer because, for example, the prior art references fail to teach or suggest each and every limitation of the claims of the present application. Because the Examiner in rejecting the claims did not mention the vapor seal limitation, Applicants presume that the Examiner has conceded that neither

Schroeder nor Schaeffer teach or suggest the step of “routing said water-wet terephthalic acid cake to a vapor seal zone,” and is again relying on common knowledge to support the assertion that this step would have been obvious. However, Applicants have already addressed why reliance on common knowledge or official notice regarding this limitation will not support a *prima facie* case of obviousness in this case, and direct the Examiner’s attention to Applicants’ preceding arguments on the matter. Accordingly, because neither Schroeder nor Schaeffer, either alone or in combination, teach or suggest the step of “routing said water-wet terephthalic acid cake to a vapor seal zone” as recited in each of the independent claims of the present application, they cannot support a *prima facie* case of obviousness, and Applicants request that the obviousness rejection predicated on Schroeder and Schaeffer be withdrawn.

In addition to the foregoing deficiencies, Applicants submit that neither Schroeder nor Schaeffer teach or suggest the step of “adding at least one diol to said water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form said carboxylic acid/diol mixture” as recited in each of independent claims of the present application. Applicants further respectfully submit that the Examiner is again misinterpreting the prior art.

The Schroeder reference is directed towards the purification of crude TPA by hydrogenation. Contrary to the Examiner’s assertions, Schroeder does not inherently disclose a water-wet carboxylic acid cake. Rather, Schroeder clearly and consistently discloses an aqueous terephthalic acid *solution*, and emphasizes that the hydrogenation is carried out at temperatures and pressures sufficient to “maintain the solution in *liquid*

phase." Col. 4, ll. 26-29 (emphasis added). There is also nothing in Schroeder to teach or suggest adding a *diol* to a water-wet carboxylic acid cake, because Schroeder makes no mention of diols anywhere in the disclosure. Further, in accordance with conventional methods, the process of Schroeder still requires isolation of purified TPA crystals. Col. 4, ll. 46-50; Col. 18, ll. 65-67.

The Schaeffer reference is directed towards the rapid esterification of carboxylic acids with diols. Schaeffer does not teach or suggest adding a diol to a water-wet carboxylic acid cake because the only water present in the disclosed system is the water byproduct of the esterification reaction. Thus, a water-wet carboxylic acid cake would never be formed in the process of Schaeffer because there is no water in the system until the carboxylic acid begins to react with the diol to form a water byproduct. Col. 5, ll. 37-38. Moreover, Schaeffer teaches that this water by-product must be removed from the system to facilitate the rapid completion of the esterification reaction. Col. 6, ll. 6-8. In fact, Schaeffer teaches that water must be removed such that "contact of the [water] byproduct with the [carboxylic acid/diol] mixture is minimized." Col. 5, ll. 60-67. Thus, Schaeffer specifically teaches away from the present invention by discouraging mixing of the water, carboxylic acid and diol, and further, by requiring that water be affirmatively removed from the system in order for the purpose of the patent (rapid esterification) to be achieved.

Accordingly, because, for example, Schroeder and Schaeffer fail to teach or suggest the step of "adding at least one diol to said water-wet carboxylic acid cake in a carboxylic acid/diol mixing zone to form said carboxylic acid/diol mixture," they cannot

sustain a *prima facie* case of obviousness, and the rejection based on Schroeder and Schaeffer should be withdrawn.

In addition, the Examiner has also failed to establish a *prima facie* case of obviousness based on Schroeder and Schaeffer because the Examiner has not pointed to any teachings or suggestions that would motivate a person of ordinary skill in the art to modify or combine these references. Further, the Examiner has not provided any analysis how a combination of Schroeder and Schaeffer would lead a person of ordinary skill in the art to arrive at the claimed invention. Therefore, Applicants respectfully submit that no combination of the teachings of Schroeder and Schaeffer could overcome each reference's inherent deficiencies in rendering the present invention obvious.

Other Comments Made by the Examiner

In addition to the foregoing obviousness rejections, the Examiner states in the Office Action that "the process must contain therein each and every step in the process in accord with the specification that will distinguish the process from that of the prior art." Office Action, p. 2, ll. 18-20. Applicants are unaware of any such requirement in patent law, and respectfully request that the Examiner point to the authority relied upon for this assertion. As previously stated, to establish a *prima facie* case of obviousness, the prior art must teach or suggest each and every limitation found in the claims. This means that claims which recite even a single limitation not found in the prior art are nonobvious and thus patentable over the prior art. Accordingly, a process claim needs only to recite one step not taught or suggested in the prior art to be patentable.

The Examiner also raises some arguments as to the “broadness” and clarity of the claims, and objects to certain claim terms, requesting that Applicants rewrite the claims and “be specific as to the exact process steps intended therein.” Office Action, p. 2, II. 20-26; p. 3, II. 9,10. With regard to “broadness,” Applicants have already established that the claims of the present application are not overly broad so as to encompass the prior art of record. In fact, each independent claim of the present invention recites at least two steps which are completely missing in the cited prior art, providing two independent reasons why the claims of the present application are patentable over the art of record.

With regard to clarity and precision, Applicants first contend that this objection would more properly be raised in the context of a § 112 rejection. If the Examiner is truly objecting to the particularity and precision of the claims, such needs to be addressed in a proper § 112 rejection, and not under § 103. However, Applicants respectfully submit that an indefiniteness rejection under § 112 would be improper because each and every claim limitation finds clear and precise support in the teachings and content of the specification, which describes, in exacting detail, the various processes of the claimed invention. For example, Applicants direct the Examiner’s attention to the “Summary of the Invention” on pages 6-13, and the detailed “Description of the Invention” on pages 13-25 of the specification. Applicants also note that “claim language must be analyzed, not in a vacuum, but in light of: (A) The content of the particular application disclosure; (B) The teachings of the prior art; and (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.” M.P.E.P. § 2173.02. In light of the

detailed drawings and comprehensive description of the claimed processes at pages 13-25 of the application, and further in view of the prior art teachings regarding conventional purification and esterification of carboxylic acids and TPA, Applicants respectfully maintain that a person of ordinary skill in the art would have no problem understanding the teaching and content of the claims and their intended scope.

Moreover, “[b]readth of a claim is not to be equated with indefiniteness.” M.P.E.P. § 2173.04 (citing *In re Miller*, 441 F.2d 689, 169 U.S.P.Q. 597 (C.C.P.A. 1971)). Thus, merely because the Examiner views Applicants’ claims to be broad in scope, does not mean that these claims are any less clear in their content. Each of the recited claims is consistent with and supported by the specification, and as such, is fairly within the scope of what the specification teaches and enables.

In the Office Action the Examiner also objects to Applicants’ use of certain terminology. In particular, the Examiner states that “Applicants ‘water-wet’ cake while defined in the lexicographer may interpret the art,” that “the recited ‘routing’ is repugnant to scientific language,” and that “the recited ‘mixing zone’ may be interpreted as the reacting zone for further polymerization.” Office Action, p. 3, II. 4-9. Applicants stress that the claim terms must not be read in a vacuum and submit that these terms are clear when read in light of the specification.

With regard to the term “water-wet,” Applicants direct the Examiner’s attention to page 4 of the application, where this term is defined. Specifically, the application explains that after “the slurry or cake terephthalic acid product is filtered to produce a terephthalic acid cake with solvent and a solvent mother liquor stream” the “terephthalic acid cake with solvent is then washed (rinsed) with water to recover residual metal

catalyst material and *to produce a water-wet terephthalic acid cake and a solvent/water by-product liquor.*" (emphasis added). The term "water-wet" simply denotes that water is the type of liquid in the carboxylic acid wet cake. Thus, Applicants' use of the term "water-wet" would be clearly understood by a person of ordinary skill in the art. Regarding the term "routing," Applicants direct the Examiner's attention to page 22 of the specification, which explains in detail the step of "routing" the water-wet carboxylic acid cake to the vapor seal zone. Thus, Applicants submit that use of this term would be clearly understood by a person of ordinary skill in the art. Finally, regarding the term "mixing zone," Applicants direct the Examiner's attention to pages 22-23 of the specification, which explains that the "mixing zone" is where the water-wet carboxylic acid cake is mixed with a diol to remove a portion of the water from the water-wet carboxylic acid cake, thus forming the carboxylic acid/diol mixture suitable for polyester or co-polyester production. The specification even gives specific examples of suitable devices for the mixing zone. Thus, Applicants respectfully maintain that this term would be clearly understood by persons of ordinary skill in the art.

Moreover, Applicants note that although "[e]xaminers are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used, [they] should not reject claims or insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement." M.P.E.P. § 2173.02. A fundamental principle of patent law is that applicants are their own lexicographers. 35 U.S.C. § 112. In this case, because these terms are fully supported and sufficiently explained in the specification, Applicants' use of these terms in the claims is clear and the Examiner's rejections with regard to these terms must

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respectfully be withdrawn. "As noted by the court in *In re Swinehart*, 439 F.2d 210, 160 U.S.P.Q. 226 (C.C.P.A. 1971), a claim may not be rejected solely because of the type of language used to define the subject matter for which patent protection is sought." M.P.E.P. § 2173.01.

Provisional Nonstatutory Obviousness-Type Double Patenting Rejection

In the Office Action, the Examiner provisionally rejects claims 1-51 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-77 of co-pending U.S. Application No. 10/271,058, or claims 1-35 of co-pending U.S. Application No. 11/076,840, or claims 1-30 of co-pending U.S. Application No. 11/077,481. Because this is a *provisional* rejection, Applicants will respond should these applications mature into patents and become the basis for an actual rejection on the same ground. In such case, Applicants will take appropriate action at such time as required by the rejection.

Nonstatutory Obviousness-Type Double Patenting Rejection

In the Office Action, the Examiner provisionally rejects claims 1-51 on the ground of nonstatutory obviousness-type double-patenting over the claims of allowed U.S. Application No. 10/383,126. To reject a claim on the ground of obviousness-type nonstatutory double patenting, the Examiner must prove the claimed subject matter is not patentably distinct from the subject matter claimed by the reference patent. M.P.E.P. § 804(II)(B)(1). A double patenting rejection of the obviousness-type is analogous to a rejection based on a failure to meet the nonobviousness requirement of

35 U.S.C. § 103. Therefore, the Examiner must apply the same factual inquiries required for evaluating a claim in light of 35 U.S.C. § 103 to perform a proper analysis for obviousness-type double patenting. These inquiries are generally referred to as the *Graham* inquiries because they were originally outlined in *Graham v. John Deere Co.*, 383 U.S. 1, 148 U.S.P.Q. 459 (1966). The *Graham* inquiries are summarized as follows:

- (1) Determine the scope and content of the reference claim relative to the claim in the examined application;
- (2) Determine the differences between the scope and content of the patent claim and the claim in the application at issue;
- (3) Determine the level of skill in the pertinent art; and
- (4) Evaluate any objective indicators of nonobviousness.

The Examiner's conclusion of obviousness-type double patenting must be made in light of these factual inquiries. M.P.E.P. § 804 (II)(B)(1). Further, the Examiner must clearly denote the differences between the conflicting claims and provide reasons as to why one skilled in the art would conclude that the invention defined in the claims at issue would have been an obvious variation of the invention defined in the claims of the reference patent. *Id.* In addition, a proper rejection based on obviousness-type double patenting includes appropriate rationale supporting the rejection of the claims in the application at issue, in view of the claims of the reference patent. *Id.*

Although an obviousness-type double patenting rejection is similar to a rejection under 35 U.S.C. § 103, a rejection based on obviousness-type double patenting excludes the use of the reference patent disclosure as prior art. *Id.* Thus, a proper rejection for obviousness-type double patenting is based solely on the content of the

claims in the application and the claims in the reference patent. Although, it may be appropriate to consider portions of the reference disclosure that specifically pertain to the invention claimed in the reference patent, such as, for example as a dictionary to learn the meaning of a term in the patent claim. *Id.* However, it is always improper to include information external to the application claims and/or reference patent claims in an obviousness-type double patenting rejection. *Id.*

“Since the analysis employed in an obviousness-type double patenting determination parallels the guidelines for a 35 U.S.C. § 103(a) rejection, the [Graham] inquiries, . . . that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103 are employed when making an obvious-type double patenting analysis. . . . The conclusion of obviousness-type double patenting is made in light of these factual determinations.” M.P.E.P. § 804 (II)(B)(1). However, in the Office Action, the Examiner did not apply the Graham factors in rejecting the claims of the present application for obviousness-type double patenting. Rather, the Examiner merely concludes that the claims of the present application and the claims of the allowed Application No. 10/383,126 are not patently distinct from each other because they are both “drawn to a process for producing a carboxylic acid/diol mixture which contains the same steps wherein there, inherently, exist (sic) a water-wet cake wherein water is removed.” No further analysis or explanation was provided for this conclusion.

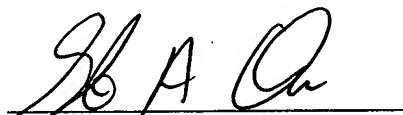
Further, it appears that the Examiner did not consider the differences between the claimed invention and the claims of the 10/383,126 disclosure. For example, there is no mention of the vapor seal zone in the 10/383,126 disclosure, nor is there any teaching or suggestion of routing the water-wet carboxylic acid to a vapor seal zone

prior to mixing with a diol. The Examiner also did not provide specific reasons why it would be have been obvious to a person of ordinary skill in the art to modify the process disclosed in 10/383,126 to arrive at the claimed invention. Thus, the Examiner's single, conclusory statement has not been supported by any analysis under the *Graham* factors. Accordingly, Applicants respectfully submit that the Examiner did not formulate a proper rejection for obviousness-type double patenting, and respectfully request that such be withdrawn.

Conclusion

In view of the foregoing a Notice Allowance appears to be in order and such is courteously solicited. Should the Examiner have any questions, please contact the undersigned at (423) 229-5534.

Respectfully submitted,



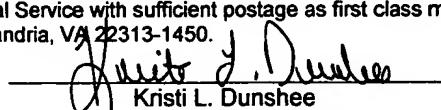
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11-1-06

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